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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/073,196	02/13/2002	Kimio Tsunemasu	8037-1001	5276
466	7590	10/07/2003	EXAMINER	
YOUNG & THOMPSON 745 SOUTH 23RD STREET 2ND FLOOR ARLINGTON, VA 22202			MITCHELL, JAMES M	
			ART UNIT	PAPER NUMBER
			2827	

DATE MAILED: 10/07/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/073,196	TSUNEMASU, KIMIO	
	Examiner	Art Unit	
	James M. Mitchell	2827	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 June 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 8-14 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 8-14 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

2. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 8, 11 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chang (US 5,578,527) in combination with Potter (US 6,444,563).

4. Chang (Fig 1A) discloses a semiconductor device (30) having a mounting surface (not labeled) that is attached to a circuit board (10; via substrate with conductors), plural reinforcing pads (32) on said mounting surface of said semiconductor device that are each adjacent to a respective corner of said mounting surface, and plural first solder balls (22; Col. 3, Lines 29-36) on each reinforcing pads, each of said plural first solder balls separately attaching the semiconductor device to the

circuit board, wherein said reinforcing pads each have a periphery adjacent to said plural ones of said first solder balls; with a plural second solder balls (via in contact with center pad portion) and not on reinforcing pads (via end pads).

5. Chang does not appear to disclose that the pads when seen in plan view of said mounting surface is at least semicircular.

6. Potter (Fig 5) utilizes pads (12, 22) that are at least semicircular.

7. It would have been obvious to one of ordinary skill in the art to form conductive material that is least semicircular on Chang in order to provide pads as required by Chang.

8. Claims 10, 12 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chang (US 5,578,527) in combination Darveaux et al. (U.S 6,201,305).

9. Chang discloses elements stated in paragraph 4 and further discloses at least two balls at ends that are away from the center and therefore distal, that is in line with the periphery of the pad, but does not appear to disclose the reinforcing pad comprises a V shape.

10. However Darveaux (Fig 3A) utilizes an X shape pad (28) that is formed of V shapes with a periphery that has roundness that when seen in a plan view is semicircular.

11. It would have been obvious to one of ordinary skill in the art to form conductive material that is X shape, which also comprises a V shape on Chang, such that the balls are formed are at distal ends of the V shaped pads with semicircular ends in order to provide pads as required by Chang.

12. In any case, absent evidence of criticality, it would have been an obvious matter of design choice bounded by well known manufacturing constraints and ascertainable by routine experimentation and optimization to form the reinforcing pads in any shape including V, or semicircular because applicant has not disclosed that the dimensions are for a particular unobvious purpose, produce an unexpected result, or are otherwise critical, and it appears prima facie that the process would possess utility using another dimension. Indeed, it has been held that mere dimensional limitations are prima facie obvious absent a disclosure that the limitations are for a particular unobvious purpose, produce an unexpected result, or are otherwise critical. See, for example, *In re Rose*, 220 F.2d 459, 105 USPQ 237 (CCPA 1955); *In re Rinehart*, 531 F.2d 1048, 189 USPQ 143 (CCPA 1976); *Gardner v. TEC Systems, Inc.*, 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), cert. denied, 469 U.S. 830, 225 USPQ 232 (1984); *In re Dailey*, 357 F.2d 669, 149 USPQ 47 (CCPA 1966).

13. Claims 8, 11 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chiu (US 5,955,784) in combination with Potter (US 6,444,563).

14. Chiu (Fig 1a, 6; Col. 2, Lines 35-36) discloses a semiconductor device (10) having a mounting surface (not labeled) that is attached to a circuit board (Col. 1, Lines 34-43), plural reinforcing pads (11) on said mounting surface of said semiconductor device that are each adjacent to a respective corner of said mounting surface, and plural first solder balls (12; via balls coated with gold) on each reinforcing pads, each of said plural first solder balls separately attaching the semiconductor device to the circuit board, wherein said reinforcing pads each have a periphery adjacent to said plural ones

of said first solder balls; with a plural second solder balls (via in contact with center pad portion) and not on reinforcing pads (via end pads).

15. Chiu does not appear to disclose that the pads when seen in plan view of said mounting surface is at least semicircular.

16. Potter (Fig 5) utilizes pads (12, 22) that are at least semicircular.

17. It would have been obvious to one of ordinary skill in the art to form conductive material that is least semicircular on Chiu in order to provide pads/contacts as required by Chiu.

18. Claims 9, 10 and 13-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chui (US 5,955,784) in combination Darveaux et al. (U.S 6,201,305).

19. Chiu discloses the elements of paragraph 14 and further discloses at least four balls at ends that are away from the center and therefore distal, that is in line with the periphery of the pad, but does not appear to disclose the reinforcing pad comprises an V or X shape.

20. However Darveaux (Fig 3A) utilizes an X shape pad (28) that is formed of V shapes with a periphery that has roundness that when seen in a plan view is semicircular.

21. It would have been obvious to one of ordinary skill in the art to form conductive material that is X shape, which also comprises a V shape on Chiu, such that the balls are formed are at distal ends of the V or X shaped pads with semicircular ends in order to provide pads as required by Chiu.

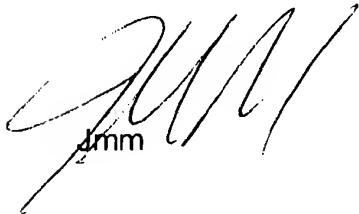
22. Further in regards to the shape of the pads, see paragraph 12.

Conclusion

23. Any inquiry concerning this communication or earlier communications from the examiner should be directed to James M. Mitchell whose telephone number is (703) 305-0244. The examiner can normally be reached on M-F 10:30-8:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kamand Cuneo can be reached on (703) 308-1233. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.



Handwritten signature of James M. Mitchell, with the initials "Jmm" printed below it.

DAVID E. GRAYBILL
PRIMARY EXAMINER



Handwritten signature of David E. Graybill.